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# INSTRUCTIONS FOR DISINFECTION.

BASED ON THE CIRCULAR OF  
THE NATIONAL BOARD OF HEALTH.

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## INSTRUCTIONS FOR DISINFECTION.

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Disinfection is the destruction of the poisons of infectious and contagious diseases.

Deodorizers, or substances that destroy smells, are not necessarily disinfectants, and disinfectants do not necessarily have an odor. The poisons of infectious diseases seldom have any odor. Disinfection cannot compensate for want of cleanliness, nor of ventilation.

As so many diseases are spread by a poison or virus which can retain its virulence apart from the body in which it was formed, and can be conveyed by infected articles, or by the air or water to other localities, the importance of disinfection, and its power to control disease, is plain. Scarlet fever, diphtheria, typhoid fever, epidemic dysentery, cholera, and like diseases, are spread by poisons that can be destroyed by disinfection.

Filth is one of the chief predisposing causes to diseases of the class mentioned, if it is not under certain conditions capable of developing them spontaneously. While cleanliness and the removal of all filth are essential conditions of health, disinfectants serve a useful purpose in arresting putrefactive decay, in rendering innoxious for the time accumulations of filth that it may be inexpedient to disturb, and in destroying contagion. Infected articles can be rendered harmless by the use of disinfectants. Anything that has come in contact with the infected person may be the means of communicating disease. As a rule the excretions of all kinds are especially charged with the contagion, either in an active state, or in one from which it is rapidly developed. The degree of contact necessary for infection varies with different diseases and the virulence of the disease; but as we never know from what case an epidemic may start, precautions for the general safety should be used in all cases.

It may be stated in general that moisture renders the low organisms, associated with the spread of these diseases, and their germs



more readily destructible by disinfectants. It has been found that the disinfection from the fumes of burning sulphur is more complete when the air of the room has previously been rendered moist.

### DISINFECTANTS.

1. Sulphur; roll sulphur, broken in small pieces, is the best form to use for burning.

2. Sulphate of iron (copperas), dissolved in water, in the proportion of one and a half pounds to the gallon; for water closets, sewers, yards, stables, etc.

3. Sulphate of zinc and common salt, dissolved in water in the proportion of four ounces sulphate and two ounces salt to the gallon; for clothing, bed linen, and cotton goods.

4. Heat is the best disinfectant known thus far. The Board would advise cities and towns to purchase furnaces made for this purpose, to be used in connection with laundries, for the sole purpose of disinfection; the destruction of many articles would thus be avoided. A temperature of at least  $240^{\circ}$  is required. For rooms in dwelling houses fumigation by the sulphur process is the best.

For common use, and especially for domestic use for the house and its surroundings, the first three on the list are unqualifiedly recommended as reliable, efficient, and inexpensive.

### SUPPLEMENTARY LIST.

1. The bichloride of mercury dissolved in water, one part to two thousand, has recently been shown to be the most efficient agent to arrest putrefaction, and destroy low organisms and their germs. It is the most powerful germicide known. It is useful in disinfecting the excretions, especially those from the kidneys and bowels. Bichloride of mercury or corrosive sublimate is an active poison, and must be used intelligently, and with care. The dilute solution is not particularly dangerous, but for domestic use the zinc solution is preferable.

2. Solution of chloride of zinc, one part liquor zinci chloridi to 200 of water, and solutions of the nitrate of lead, of varying strength, are useful for sinks, waste basins, sewers, and the like. Chlorinated soda and permanganate of potash are useful disinfectants. Caustic lime (1 part to 100 of water) is efficient, but leaves a sediment; it must

be used alone ; it is useful dry, after vaults have been cleaned, and to destroy organic matter buried with it, if used freely. Chloride of iron is efficient, but expensive. The waste chlorides of commerce can be utilized for drains, refuse heaps, and sewers.

Carbolic acid and other agents, offensive in themselves, are not recommended. Carbolic acid, to be effective (1 part to 100), is also more expensive ; for filth, stronger solutions must be used.

## HOW TO USE DISINFECTANTS.

1. It is doubtful if any disinfectant can be used to thoroughly purify the air of the sick-room while in use, so as to destroy the contagion. Many substances, however, contribute to that end by destroying organic matter. The use of such as are offensive should be absolutely precluded. A sheet can be wet in the zinc solution and hung in the room or entry, and besides the zinc solution chlorinated soda, permanganate of potash and copperas can be freely used. The attendants on the sick-room should use disinfecting solutions to wash their hands, and it is sometimes advisable for them to rinse the mouth and throat with solution of chlorinated soda, or permanganate of potash.

There are some disinfectants that can be burned in occupied rooms and entries near the sick-room without giving rise to offensive gases. Turpentine has been recommended for use in such places, as follows: pour a little upon the surface of a pan of hot water, using enough so that the odor is just perceptible in the air, not so much as to become offensive.

Pure air and thorough ventilation are the best agents ; all others are but substitutes, and can never equal their principals. Sometimes, however, filth is so concentrated, and the poison so strong, that artificial aid has to be sought for artificial and unnatural conditions.

IN THE SICK-ROOM. The most available agents are fresh air and cleanliness. The clothing, towels, bed-linen, etc., should, on removal from the patient, and before they are taken from the room, be placed in a pail or tub of the zinc solution, boiling hot if possible. After removal from the solution they should be boiled in clear water. If soap is to be used the solution of chlorinated soda is more convenient to be used as a disinfectant.

All discharges should either be received in vessels containing



copperas solution, or when this is impracticable, should be immediately covered with copperas solution. All vessels used about the patient should be cleansed with the same solution. The solution of bichloride of mercury is advisable in case of cholera or the prevalence of an epidemic. One advantage of the copperas solution is that it fills so many purposes, hence not so many different solutions are required; it is unqualifiedly recommended. The disinfectant solution should be added to the water with which the patient has been bathed before the water is thrown away.

Unnecessary furniture, especially that which is stuffed, carpets and hangings, should, when possible, be removed from the room at the outset; otherwise, they should remain for subsequent fumigation and treatment.

2. FUMIGATION with sulphur is the only practicable method for disinfecting the house. For this purpose, the rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles which cannot be treated with the zinc solution, should be opened and exposed during fumigation, as directed below. Close the rooms as tightly as possible, place the sulphur in iron pans supported upon bricks placed in washtubs containing a little water, set it on fire by hot coals or with the aid of a spoonful of alcohol, and allow the room to remain closed for twenty-four hours. For a room about ten feet square, at least two pounds of sulphur should be used,—that is, two pounds for every thousand cubic feet of air space; for larger rooms, proportionately increased quantities. If the room is large the sulphur should be put in several places in separate vessels. The room should not be too cold. After fumigation the room should be thoroughly aired at least twelve hours. The fumes of burning sulphur cannot be breathed.

In case of an epidemic or malignant sickness, the woodwork of the room may be re-painted. If there be any wall paper it may be removed and burned, and the ceiling whitewashed or kalsomined.

3. PREMISES. Cellars, yards, stables, gutters, privies, cesspools, water-closets, drains, sewers, etc., should be frequently and liberally treated with the copperas solution. The copperas solution is easily prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water. The frequent use of this solution in privies and water-closets is advised, especially in summer.

4. **BODY AND BED CLOTHING, ETC.** It is *best* to burn all articles which have been in contact with persons sick with contagious or infectious diseases. Articles too valuable to be destroyed should be treated as follows:

(a.) Cotton, linen, flannels, blankets, etc., should be treated with the boiling-hot zinc solution; introduce piece by piece, secure thorough wetting, and boil for at least half an hour.

(b.) Heavy woolen clothing, silks, furs, stuffed bed-covers, beds, and other articles which cannot be treated with the zinc solution, should be hung in the room during fumigation, their surfaces thoroughly exposed, and pockets turned inside out. Afterward they should be hung in the open air, beaten and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., should be thoroughly fumigated, and afterwards well aired. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten. Heat,—if a furnace, as before mentioned, is available,—is the most efficient means of disinfecting all such articles.

5. **CORPSES** should be thoroughly washed with a zinc solution of double strength; should then be wrapped in a sheet, wet with the zinc solution, and buried at once. The solution of bichloride of mercury is advised for this purpose in very malignant cases, or in presence of an epidemic. The burial should be private; no public burials should be allowed.

Metallic, metal-lined, or air-tight coffins should be used when possible; certainly when the body is to be transported for any considerable distance. They are required by law, unless the burial is to be immediate, or efficient disinfection. In malignant cases the coffin should be half-filled with sawdust, moistened with the disinfectant, and should not be re-opened.

This circular is based on that of the National Board of Health, and is largely as issued by them. Changes and additions have been made since the first edition, which was soon exhausted, but the press of other work prevented a re-issue. It seems now to be required, as indicated by the demand for such instructions.



